

CLAIMS

Inventor , Launeil Neil Sanders, claim:

1. A raw influent treatment process eliminating secondary biological treatment comprising:
 - a) adding to raw influent a commercially available alum solution ;
 - b) adding to raw influent a commercially available alum solution with addition being continuously controlled by continuous in-line pH controller to pH of 5.7 to 6.0 ;
 - c) adding to raw influent from about 0.25 to 3.0 parts per million of a nonionic , cationic or anionic commercial polyelectrolyte polymer to increase settling rate , agglomeration , and effectiveness of sedimentation and increase Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies producing a supernatant liquid layer from which the color bodies and 95% of organics are removed ;
 - d) monitoring and controlling the Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies across the primary clarifier(s) by insertion of Continuous in-line Chemical Oxygen Demand Analyzer at outlet of primary clarifier(s) ;
 - e) separating the supernatant liquid layer from which the color bodies and organics have been removed ;
 - f) removing the sludge from primary clarifier(s) underflow , dewatering the sludge , incineration in existing bark power boilers or other incineration , regeneration and the recycle of a portion of recovered chemicals , and wasting of sludge up to approximately 20% to 35% depending on content of inert boiler ash in raw influent which consists of adding cationic , anionic or non-ionic polymers in dewatering ;
 - g) that supernatant liquid layer passes on to other final polishing /pH adjustment , if needed , and since Chemical Oxygen Demand , Total Organic Carbon , and Color removal efficiencies are exceedingly high , greater than 95% , no biological treatment is required and secondary biological treatment is eliminated ;
2. A raw influent treatment process eliminating secondary biological treatment according to claim 1 comprising:
 - a) adding to raw influent a commercial aluminum chloride liquid solution ;
 - b) adding to raw influent a commercial aluminum chloride liquid solution with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;
3. A raw influent treatment process eliminating secondary biological treatment according to claim 1 comprising:
 - a) adding to raw influent a commercial ferric chloride liquid solution ;
 - b) adding to raw influent a commercial ferric chloride liquid solution with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;

4. A raw influent treatment process eliminating secondary biological treatment according to claim 1 comprising:
 - a) adding to raw influent a commercial ferrous sulfate solution ;
 - b) adding to raw influent a commercial ferrous sulfate solution with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;
5. A raw influent treatment process eliminating secondary biological treatment according to claim 1 comprising:
 - a) adding to raw influent a commercial ferrous sulfate solution and sulfuric acid ;
 - b) adding to raw influent a commercial ferrous sulfate solution and sulfuric acid with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;
6. A raw influent treatment process eliminating secondary biological treatment according to claim 1 comprising:
 - a) adding to raw influent the desired reagent chemicals to the desired pH of 5.7 to 6.0 delivers a primary clarifier(s) effluent with 40 to 65 milligrams per liter of Chemical Oxygen Demand , 40 to 65 milligrams per liter of Total Organic Carbon , and 100 to 250 milligrams per liter of Color respectively.
 - b) that in other old art it was noted that conventional biological treatment was required whereas in this invention no secondary treatment is required and directly results in approximately 100% elimination of aerators' horsepower and maintenance which results in economic electrical energy savings to the Pulp and Paper industry .
7. A raw influent treatment process eliminating secondary biological treatment which comprises contacting raw influent containing lignins , lignin degradation products, humic acids , sulphates(ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorine , hypochlorite , caustic extraction , chlorine dioxide stages groundwood pulping , thermomechanical pulping and all like in combined raw influent sewer :
 - a) adding to raw influent the barium chloride and mixture of hydrochloric acid reagent chemicals to the desired pH of 5.7 to 6.0 ;
 - b) adding to combined raw influent the barium chloride and hydrochloric acid reagents with addition being continuously controlled by continuous in-line pH controller to a pH of 5.7 to 6.0 ;
 - c) adding to raw influent from about 0.25 to 3.0 parts per million of a nonionic , cationic or anionic commercial polyelectrolyte polymer to increase settling rate , agglomeration , and effectiveness of sedimentation and increase Color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies producing a supernatant liquid layer from which the color bodies and 95% of organics are removed ;
 - d) monitoring and controlling the Color , Chemical Oxygen Demand , and Total Organic Carbon

- removal efficiencies across the primaryclarifier(s) by insertion of Continuous on-line Chemical Oxygen Demand Analyzer at outlet of primaryclarifier(s) ;
- e) separating the supernatant liquid layer from which the color bodies andorganics have been removed ;
 - f) removing the sludge from primaryclarifier(s) underflow , dewatering the sludge , incineration in existing bark power boilers or other incineration , regeneration and the recycle of a portion of recovered chemicals , and wasting of sludge up to approximately 20% to 35% depending on content of inert boiler ash in raw influent which consists of adding cationic , anionic or non-ionic polymers indewatering ;
 - g) that supernatant liquid layer passes on to other final polishing and since Chemical Oxygen Demand , Total Organic Carbon , and Color removal efficiencies are exceedingly high , greater than 95% , no biological treatment is required and secondary biological treatment is eliminated ;
8. A raw influent treatment process eliminating secondary biological treatment which comprises contacting raw influent containing lignins , lignin degradation products, humic acids , sulphates(ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorine ,hypochlorite , caustic extraction , chlorine dioxide stages groundwood pulping ,thermomechanical pulping and all like in combined raw influent sewer :
- a) adding to raw influent the barium sulfide liquid , borax , sodium silicate liquid mixture reagent chemicals to the desired pH of 5.5 to 6.0 ;
 - b) adding to combined raw influent the barium sulfide liquid , borax , sodium silicate liquid mixture reagent chemicals with addition being continuously controlled by continuous in-line pH controller to a pH of 5.5 to 6.0 ;
 - c) adding to raw influent from about 0.25 to 3.0 parts per million of a nonionic , cationic or anionic commercial polyelectrolyte polymer to increase settling rate , agglomeration , and effectiveness of sedimentation and increase color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies producing a supernatant liquid layer from which the color bodies and 95% oforganics are removed ;
 - d) monitoring and controlling the color , Chemical Oxygen Demand , and Total Organic Carbon removal efficiencies across the primary clarifier(s) by insertion of Continuous in-line Chemical Oxygen Demand Analyzer at outlet of primary clarifier(s) ;
 - e) separating the supernatant liquid layer from which the color bodies andorganics have been removed ;
 - f) removing the sludge from primaryclarifier(s) underflow , dewatering the sludge , incineration in existing bark power boilers or other incineration , regeneration and the recycle of a portion of recovered chemicals , and wasting of sludge up to approximately 20% to 35% depending on content of inert boiler ash in raw influent which consists of adding cationic , anionic or non-ionic polymers indewatering;
 - g) that supernatant liquid layer passes on to other final polishing/pH adjustment ,if needed , and since

Chemical Oxygen Demand , Total Organic Carbon , and Color removal efficiencies are exceedingly high , greater than 90% , no biological treatment is required and secondary biological treatment is eliminated;

9. A raw influent treatment process eliminating secondary biological treatment which comprises contacting raw influent containing lignins , lignin degradation products , humic acids , sulphates (ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorine , hypochlorite , caustic extraction , chlorine dioxide stage , groundwood pulping , thermomechanical pulping and all like in combined raw influent sewer according to claim 1 , comprising :
- a) removing all organics , color bodies and Chemical Oxygen Demand materials across primary clarifiers ;
 - b) removing organics , color bodies and Chemical Oxygen Demand materials across primary clarifiers with in-line continuous pH controller adjusting to pH 5.7 to 6.0 ;
 - c) removing organics , color bodies and Chemical Oxygen Demand materials across primary clarifiers results in 95% removal efficiencies for Chemical Oxygen Demand , Total Organic Carbon , and color bodies whereas existing actual data from Bowater and International Paper , Figure 2 , the wastewater goes through aeration biological systems unchanged in degradation of organics , Chemical Oxygen Demand materials ; whereas
 - d) that Bowater influent concentrations , outlet primary clarifier concentrations , and outlet of aerated secondary biological aeration were the same (no change) at 795 milligrams per liter of Chemical Oxygen Demand , 368 milligrams per liter of Total Organic Carbon , and 2820 milligrams per liter of Color with no biodegradation and no biological oxidation across existing secondary aeration systems ; whereas
 - e) in existing Boise Southern , DeRidder , Louisiana , raw influent for which 280 raw influent samples treated as in and according to claim 1 , claim 2 , claim 3 , claim 4 and claim 5 resultant was 95% removal of BOD , COD , TOC , and Color ; whereas
 - f) in existing Boise Southern , DeRidder , Louisiana , raw influent Biological Oxygen Demand of 235 milligrams per liter was immediately reduced by chemicals treatment to 40 milligrams per liter Biological Oxygen Demand and subsequent 95% organic reductions were achieved ;
 - g) furthermore in existing Boise Southern , DeRidder , Louisiana , raw influent if you can add reagent chemicals here and immediately get 90% Biochemical Oxygen Demand which is in what it takes you to obtain in 23 days retention time across the aerated stabilization basin , question of is there any biological degradation taking place ? ;
 - h) only that since pulping and paper operations results in configuring negative electrical charges on the lignins and other lignin ringed compounds , it is more than likely these electrical charges that are measured by the Biochemical Demand Test , the great fakery , fraud of the Biochemical Oxygen Demand

test ;

i) furthermore the Biochemical Oxygen Demand Test is defective and insertion of Continuous in-line Chemical Oxygen Demand Analyzer exiting primaryclarifiers is required ;

j) secondary biological oxygen treatment is eliminated as ncbiodegradation takes place , no bugs are living degrading any organic bodies .

10. A raw influent treatment process eliminating secondary biological treatment which comprises contacting

raw influent containing lignins , lignin degradation products, humic acids , sulphates(ites) attached to ring structures , cellulose fibers , cooking chemicals and like from pulping , lime kiln , bleach plants including chlorine ,hypochlorite , caustic extraction , chlorine dioxide stages,groundwood pulping ,thermomechanical pulping and all like in combined raw influent sewer according to claim 1 , comprising :

a) providing optimum removal efficiencies for chlorinated organics and Adsorbable Organic Halogens (AOX) ;

b) providing optimum removal efficiencies for dioxins , other chlorinated organics , other organics , and achieving average Total Organic Carbon concentration exiting primaryclarifiers less than 65 milligrams per liter ;